

GB116702

Publication Title:

Improvements in Reinforced Concrete

Abstract:

Abstract of GB116702

116,702. Soc. des Navires en Ciment Arme. May 29, 1917, [Convention date]. Reinforced-concrete walls; re-inforced concrete .-A reinforcement for a flat or curved concrete wall or partition consists of superposed metallic fabrics N<1>, N<2> tied together by bonds g and with flattened wire helices f placed between them and normal to the faces of the concrete. Each fabric consists of parallel wires a tied by transverse fine wires b twisted together, so that the fabric can be bent to the shape desired; the wires a of adjacent fabrics are crossed preferably at right-angles. Spacing-member or keys d are secured at intervals on the faces of the complete reinforcement for the attachment of moulding-boards e, and may also be placed between adjacent fabrics.

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PATENT



SPECIFICATION

Convention Date (France), May 29, 1917.

Application Date (In the United Kingdom), May 22, 1918. No. 8612/18.

Complete Accepted, Dec. 5, 1918.

COMPLETE SPECIFICATION.

Improvements in Reinforced Concrete.

We, SOCIÉTÉ DES NAVIRES EN CIMENT ARMÉ (SOCIÉTÉ EN PARTICIPATION), of 19, rue de la Rochefoucauld, Paris, France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

- 5 This invention relates to the construction of metal reinforcements for reinforced concrete walls or partitions. The reinforcement is applicable for walls or partitions of large dimensions and of curved, flat or shaped surface, the resistance and homogeneity of which, together with the speed of manufacture, are superior to those of plates constructed in the ordinary manner.
- 10 These results are obtained by using as metal reinforcement continuous elements (wires or bars) grouped in the form of fabrics, in which the reinforcing elements are parallel to each other and connected together by fine metal wires twisted with each other; this arrangement is preferably completed by adding undulating elements arranged normally to the surface of the construction for the purpose of binding the concrete.
- 15

The fabrics, which are obviously flexible in the direction of the connecting wires, may easily be curved in the direction of the reinforcing elements; they are placed in successive layers in such a manner that two consecutive layers have their elements at right angles to each other or at a certain predetermined angle, the whole forming the skeleton walls or partitions.

The elements normal to the surface, which, generally, have the form of windings, are then inserted throughout the reinforcement in such a manner that their turns or loops enter the interspaces of the net-work formed by the fabrics; they prevent the increase of the thickness of the walls under the effect of compressive strains parallel to their surface, or bending and impart to the concrete a high capacity for deforming before rupture.

The accompanying drawings illustrate the invention.

Fig. 1 is a plan of the reinforcement formed by superimposing several fabrics.

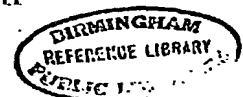
Fig. 2 is a plan of the reinforcement formed by superimposing several fabrics.

Fig. 3 and 4 are cross sections of Figs. 1 and 2 respectively.

Fig. 5 is a cross section drawn to an enlarged scale of a finished wall or partition.

The fabrics N^o 1 and N^o 2 together form a trellis. The first fabric N^o 1 consists of steel wires placed at short distances apart and connected at suitable distances along their length by fine wires, such as are twisted together and forming strands, the

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elements of which encircle wires *a* where they come in contact with them. The wires *a* which constitute the reinforcing parts of the skeleton are continuous from edge to edge of the plate. They may be easily bent and curved as each fabric is put in position as may be required for producing a proper profile.

The fabric *N*², which is the lower in Fig. 2, has its wires *c* at right angles 5 to the wires *a* of fabric *N*¹ and generally the fabrics are placed on each other so that the elements are at right angles to each other or at a certain other angle. The number of the fabrics is a function of the gauge of the wires and of the thickness of the piece to be constructed and in order that the external faces of the piece may be parallel to the metallic network, the first and the last fabrics 10 are furnished with keys, of wood for instance, such as *d*, placed here and there, and forming a point of support on the moulding boards *e*.

The keys, such as *d*, may be intercalated between two net-works within the thickness so as to economise the material placed in the middle of the slab, which material does not lend itself to bending. Finally, there are generally 15 inserted wires, such as *g*, connecting together the wires of all the fabrics of one slab for the purpose of ensuring that they are parallel and preventing any displacement in the course of construction owing to their weight, vibrations or the like. When the several fabrics of a reinforcement have been connected together there are introduced elements, such as *f*, for the purpose of producing 20 a binding effect, imparting to the concrete the power of suffering considerable deformation without rupture.

It has been found that the several modes of binding which have hitherto been used, do not lend themselves to rapid and economic use sufficiently to be industrially practical in large constructions. Moreover, they have a very 25 unequal action on the surfaces of the construction.

In the present instance the elements *f* are introduced between the wires *a* of the sheets, their loops being supported upon the wires of the first fabric as shown in Figs. 4 and 5. The elements preferred according to this invention are continuous helices obtained by winding on a very flattened cylinder wires 30 which may be curved into successive U's, presenting in the neighbourhood of each face equal surfaces of action, regularly distributed, which retain the concrete and prevent increase of volume, thus, providing a very uniform binding.

All the elements entering into the composition of the plates or partitions may 35 be made beforehand and mechanically manufactured in great lengths and by simple means. There is thus great economy of manual labour and the possibility of employing unskilled labour. Moreover, errors of work are avoided and uniformity of thickness is ensured so that the thickness may be sensibly reduced.

From the point of view of strength the walls thus formed are superior to those 40 obtained by known methods, because they are constituted by wires extending from one end to the other which may be firmly anchored at their ends, whence there is consequent reduction of internal action by adhesion; this peculiarity has again the effect of enabling steel of very high strength to be used with benefit. It is to be noted that this use, in combination with that of concrete 45 which is more adapted for deformation than those generally used, or of any other suitable plastic material, involves the benefit of the high elasticity of special steels showing very high coefficient; this gives a great suppleness to the construction and is particularly advantageous when the latter must necessarily be subjected to shock.

It is to be noted that the foregoing indications are only by way of example, 50 modifications of detail being possible to suit the particular requirement. The invention can be well adapted for the construction of beams and generally of any piece capable of being built up of reinforced concrete. In constructing a beam a suitable number of the metallic fabrics of long rectangular form may 55 be superimposed and connected together in the manner already described.

Having now particularly described and ascertained the nature of our said

invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Reinforcements for reinforced concrete consisting of metallic fabrics each formed of wires extending from end to end of the piece constructed and bonds
5 connecting the said wires at suitable distances along their length so as to form a trellis, the said fabrics being superimposed so that the wires of each fabric form an angle with those of contiguous fabrics, and connections between the superimposed fabrics so as to form rigid net-works separated from the internal and external faces of the wall and separated from each other, if necessary, by
10 distance pieces.

2. In the metallic reinforcement referred to in Claim 1, undulating metal wires arranged in a direction generally normal to the surface and presenting in the neighbourhood of each face equal surfaces of action, regularly distributed, substantially as and for the purpose set forth.

15 Dated this 22nd day of May, 1918.

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Fig. 1.

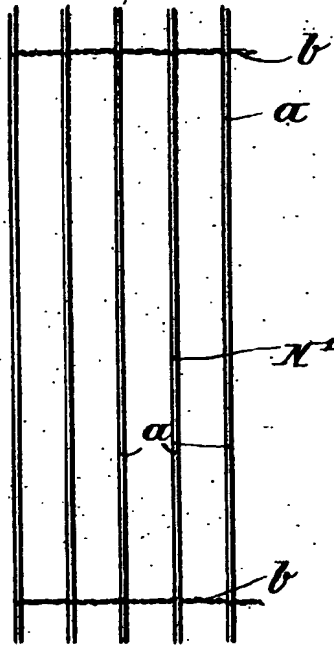


Fig. 2.

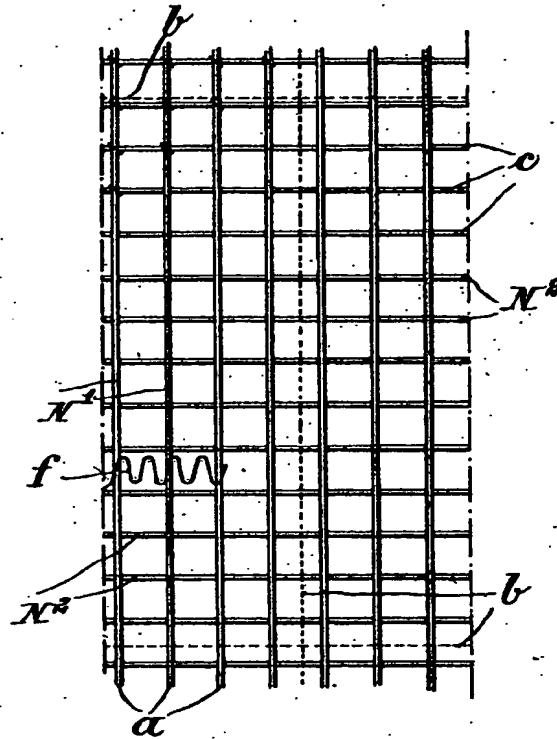


Fig. 3.

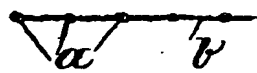


Fig. 4.

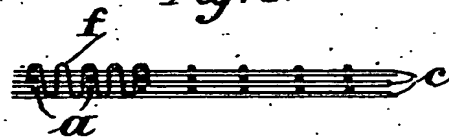
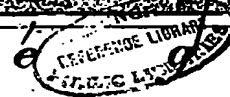
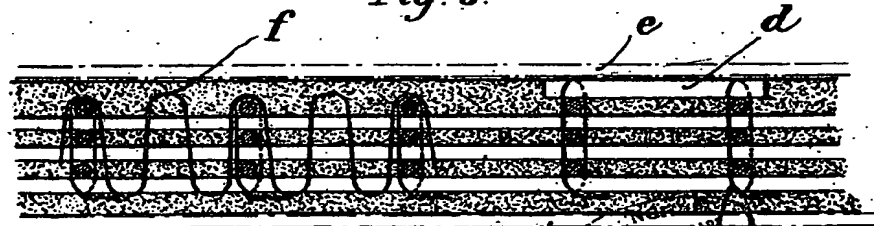


Fig. 5.



[This Drawing is a reproduction of the Original on a reduced scale.]